

REMARKS

Applicants submit the present Amendment as a full and timely response to the issues raised in the Office Action mailed March 8, 2007 (hereinafter "Office Action"). Applicants have amended Claim 13 to correct the typographical error noted on page 2 of the Office Action, thus overcoming the § 112 rejection on page 2 of the Office Action. Applicants request reconsideration and withdrawal of the remaining rejections of Claims 1-23 for at least the reasons discussed below.

The § 101 rejections

Claims 18-23 stand rejected as allegedly directed to non-statutory subject matter. Office Action, p. 3. In particular, the Office Action asserts that "the specification provides evidence that applicant intends for the computer readable medium to include transport medium (i.e. electronic, magnetic, optical, electromagnetic, infrared signals) as well as paper medium which are non-statutory." Office Action, p. 3.

Respectfully, there is no basis for this apparent assertion that "transport medium . . . as well as paper" is *per se* non-statutory. MPEP § 2106.01 states:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." *In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component.* (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works, and a compilation or mere arrangement of data.

Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. *When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.* Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)(discussing patentable weight of data structure limitations in the context of a statutory claim to a data structure stored on a computer readable medium that increases computer efficiency) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). (Emphasis added).

Claims 18-23 are computer program product claims and recite a computer readable storage medium that comprises computer readable program code that imparts functionality. As long as the medium is "computer readable," the other features of the medium, e.g., whether it is readable by the computer using magnetic, optical or other means, is irrelevant. Therefore, Applicants submit that Claims 18-23 meet the definition of statutory subject matter set forth in MPEP § 2106.01. Accordingly, Applicants respectfully submit that the § 101 rejections of Claims 18-23 are erroneous and should be withdrawn.

Independent Claims 1, 11 and 18 are patentable

Independent Claims 1, 11 and 18 stand rejected as allegedly anticipated by U.S. Patent Application Publication No. 2003/0061404 to Atwal et al. (hereinafter "Atwal"). Office Action, p. 4. Independent Claim 1 recites:

A method of providing web services, the method comprising:
 creating an electronic record of a contract for a service provider to provide web services meeting a *web service category definition* at a web services hub of a service domain; and
 providing a web service to a service requestor from the service domain responsive to the electronic record of the contract.

Independent Claims 11 and 18 recite corresponding apparatus and computer program products. A "web service category" may be further understood by reference to exemplary embodiments of the present invention illustrated in FIG. 2:

FIG. 2 depicts an overview of an exemplary web services environment according to some embodiments of the present invention. Individual service instances S1, S2, . . . , Sj, . . . Sk (in individual domains D1, D2, D3 and a service domain SCx representing an aggregation of service instances SC1, SC2, . . . SCm) are aggregated into a main domain D, and represented at a service hub 210 by a list of aggregated service ports. The service hub 210 maintains adjustable usage contracts 212 that specify a service level to which service requestor SR1, SR2 are subscribed. On the service provider side, *the service hub 210 maintains categorical contracts 214 for the "supplying" domain D to sign up to categories of service, but not specific services.*

In some embodiments of the present invention, the service hub 210 may use a periodic polling mechanism to create an overall service view (e.g., database) of the main domain D based on categorical supplier contracts. Because of the categorical nature of the provider contracts, the service view may change over time, as services

are added or deleted. For example, a service requestor that requests a service under a "finance" service category can select a variety of services currently available under that category based on the current service view. There is no need to predefine all the services to the service hub 210 in its own repository, as might be done in the prior art.

Present Application, p. 6, line 30 through p. 7, line 15 (emphasis added). In rejecting Claim 1, the Office Action asserts that Atwal teaches "creating an electronic record of a contract (modified WSDL) for a service provider to provide web services meeting a web service category definition," specifically citing a gateway module 500 shown in FIG. 5 and description of API contract processing by such a gateway that refers to FIG. 7A. Office Action, p. 3.

As described in Atwal, the "gateway module 500 is an application that sits between client applications 15 and web services 25 being offered." Atwal, paragraph [0051]. As shown in FIG. 6A, such a gateway module may receive a method call for a *specific* web service, *i.e.*, not a web service category, and determines what network location to route the method call to based on network location information stored in a web service repository "that provides a mapping from the identity of the web service (URI) to the physical location of the web service." Atwal, paragraph [0053]. Referring to the cited paragraph [0070] of Atwal, FIG. 7A shows such a gateway module forwarding a call for an API contract, e.g., an HTTP GET call that requests a representation of the specified resource (web service) being called. The gateway module receives the API contract (e.g., a WSDL document describing the resource) and modifies the contract by "addition or modification of a parameter . . . such as a modification of an address." Atwal, paragraph [0070].

The gateway module 500 described in Atwal does not perform any function corresponding to the recited "creating an electronic record of a contract for a service provider to provide web services meeting a *web service category definition*" and "providing a web service to a service requestor from the service domain responsive to the electronic record of the contract." Rather, the gateway module 500 merely mediates method and API calls such that parameters in the call may be modified or added to in manner that is transparent to the consuming client. See Atwal, paragraph [0071]. The client described in Atwal is still calling a *specific* web service. The "modified WSDL" referred to in paragraph [0070] is not "a contract for a service provider to provide web services meeting a *web service category definition*." Instead, it is a modified WSDL for a specific web service called by the client in

which some call parameters have been added or amended. Accordingly, Applicants submit that Atwal does not disclose or suggest the recitations of independent Claims 1, 11 and 18 and, for at least these reasons, Applicants submit that independent Claims 1, 11 and 18 are patentable.

The dependent claims are patentable

Applicants submit that dependent Claims 2-10, 12-17 and 19-23 are patentable at least by virtue of the patentability of the respective ones of independent Claims 1, 11 and 18 from which they depend. Applicants further submit that several of the dependent claims are separately patentable.

For example, Claim 3, which stands rejected as allegedly anticipated by Atwal (see Office Action, pp. 4 and 5), recites "wherein providing the service to the service requestor comprises providing the service to the service requestor without requiring creation of a contract for the use of a specific service instance." Contrary to the assertions of the Office Action on page 5, the gateway module actually creates a WSDL for a specific web service, e.g., the WSDL returned by in response to the API call to the web service 25 has a one-to-one correspondence to the "modified WSDL," which, as discussed above, does not correspond to a web service category. Accordingly, Applicants submit that Atwal does not disclose or suggest the recitations of Claim 3 and, for at least these reasons, Applicants submit that Claim 3 is separately patentable.

Claim 4, which also stands rejected as allegedly anticipated by Atwal (see Office Action, p. 5), recites "identifying a plurality of ports operative to provide web services meeting the service category definition at the web service hub." In rejecting Claim 4, the Office Action cites paragraphs [0059] and [0061], which describe how a call to a specific web service is routed by reference to a web service repository. There is no disclosure or suggestion in Atwal that this repository identifies ports according to a *service category definition*. Accordingly, Applicants submit that Atwal does not disclose or suggest the recitations of Claim 4 and, for at least these reasons, Applicants submit that Claim 4 is separately patentable. At least similar reasons support the separate patentability of Claims 12 and 19.

Claim 9, which stands rejected as allegedly anticipated by Atwal (see Office Action, pp. 5 and 6), recites "wherein creating an electronic record of a contract comprises creating an electronic record of a first contract, wherein the method further comprises creating an electronic record of a second contract to provide web services that meet a service level criterion to the service requestor at the web services hub, and wherein providing a web service to the service requestor comprises providing the web service to the service requestor via the web services hub responsive to the electronic records of the first and second contracts." The Office Action alleges that the recited "second contract to provide web services that meet a service level criterion" is the "modified WSDL" discussed above. *See* Office Action, p. 5. Respectfully, there appears to be nothing in Atwal that discloses or suggests that this "modified WSDL" has anything to do with a "service level criterion." Accordingly, Applicants submit that Atwal does not disclose or suggest the recitations of Claim 9 and, for at least these reasons, Applicants submit that Claim 9 is separately patentable. At least similar reasons support the separate patentability of Claims 16 and 22.

Claim 10, which stands rejected as allegedly anticipated by Atwal (see Office Action, pp. 5 and 6), recites "wherein providing a web service to the service requestor comprises dispatching a service request from the service requestor in the service domain based on the electronic records of the first and second contracts and a service policy of the web services hub." The Office Action asserts that authentication and billing functions performed by the gateway correspond to the recited "service policy." Office Action, p. 6. However, as explained in the present application at page 9, a "service policy" is a mapping of service level definitions for providers to service level definitions for users, and the authentication and billing functions described in the cited paragraphs [0086]-[0090] do not appear to perform such service level mapping. Accordingly, Applicants submit that Atwal does not disclose or suggest the recitations of Claim 10 and, for at least these reasons, Applicants submit that Claim 10 is separately patentable. At least similar reasons support the separate patentability of Claims 17 and 23.

Claim 5, which stands rejected as allegedly obvious with respect to a combination of Atwal and U.S. Patent Application Publication No. 2005/0198188 to Hickman (hereinafter "Hickman") (see Office Action, p. 7), recites:

. . . wherein identifying a plurality of ports comprises:
polling at least one web services node subordinate to the web services hub to
identify at least one service provided by the node; and
updating *a description of a service category* responsive to the polling.

In rejecting Claim 5, the Office Action cites paragraph [0083] of Atwal, which describes operations for updating the web service repository of the gateway module. The Office Action concedes that Atwal does not teach the recited polling of a subordinate web services node or the recited updating of a service category description response to the polling, but asserts that the abstract of Hickman provides the missing teachings by describing querying of a UDDI registry that contains a list of web services and identifying a desired web service and downloading a description of the desired web service. *See* Office Action, p. 8. The Office Action asserts combining this with the web service repository described in Atwal would produce the recitations of Claim 5, and that such a combination would be obvious "in order to allow the gateway to automatically discover web services." Office Action, p. 8.

As discussed above, the web service repository described in Atwal is not organized according to web service category definitions and , instead, merely provides a mapping from a web service identifier to a network location. Adding Hickman to Atwal as proposed in the Office Action could, conceivably, allow the gateway module of Atwal to query a UDDI registry as described in Hickman to add web services to the gateway module's web service repository, but this does not teach or suggest updating *a description of a service category* responsive to querying of the UDDI registry described in Hickman. Moreover, the UDDI registry described in Hickman does not appear to be a "web services node subordinate to a web services hub," as web services hubs are not described in Hickman. Accordingly, Applicants submit that the cited combination of Atwal and Hickman does not disclose or suggest the recitations of Claim 5 and, for at least these reasons, Applicants submit that Claim 5 is separately patentable. At least similar reasons support the separate patentability of Claims 13 and 20.

Claim 7, which also stands rejected as allegedly obvious based on Atwal and Hickman (see Office Action, pp. 8 and 9), recites "wherein polling at least one web services node comprises polling a plurality of levels of web services nodes using a coordinated polling interval scheme." The Office Action cites servers 13 shown in FIG. 2 and paragraph [0021] of Hickman as allegedly showing "polling of a plurality of levels of web services nodes."

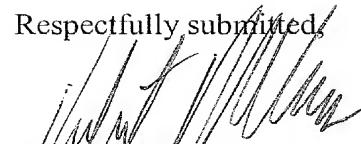
Office Action, p. 8. Respectfully, this material does not show "levels of web services." Rather, FIG. 2 and paragraph [0021] merely describe that web services at servers 13 may be accessed by a device 1 over a network 3 using identification information from a UDDI service 10. There appears to be nothing in this material regarding a "coordinated polling interval scheme." Accordingly, Applicants submit that the cited combination of Atwal and Hickman does not disclose or suggest the recitations of Claim 7 and, for at least these reasons, Applicants submit that Claim 7 is separately patentable. At least similar reasons support the separate patentability of Claim 15.

Claim 8, which also stands rejected as allegedly obvious based on Atwal and Hickman (see Office Action, p. 9), recites "wherein polling a plurality of levels of web services nodes using a coordinated polling interval scheme comprises using staggered polling intervals for adjacent levels of the web services domain." The Office Action alleges that such recitations are taught by paragraph [0010] and Claim 2 of Hickman. Office Action, p. 9. Paragraph [0010] says nothing about staggered polling intervals for adjacent levels of a web services domain. The "periodic querying" described in this passage is merely periodic querying of a UDDI registry, and has nothing to do with a relationship (e.g., "staggered") between polling intervals for different levels of web services. Claim 2 merely says that a UDDI querying method recited in Claim 1 of Hickman may be done without user interaction, which does not disclose or suggest anything about staggered polling intervals for adjacent levels of a web services domain. Therefore, Applicants submit that the cited combination of Atwal and Hickman does not disclose or suggest the recitations of Claim 8 and, for at least these reasons, Applicants submit that Claim 8 is separately patentable.

Conclusion

For the above-stated reasons, Applicants respectfully request that this application is in condition to pass to issue, which action is respectfully requested. Should the Examiner have any matters of outstanding resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

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